

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**McDonnell Douglas Corporation, now
a wholly owned subsidiary of
The Boeing Company**

for an exemption from §§ 25.571(b) and
25.671(c)(1) of Title 14, Code of Federal
Aviation Regulations

Regulatory Docket No. 29598

GRANT OF EXEMPTION

By letter of June 3, 1999, Mr. Kevin Hull, Senior Manager, Airplane Certification, The Boeing Company, 3855 Lakewood Blvd., Long Beach, CA 90846, petitioned for a time-limited exemption from the damage-tolerance requirements of § 25.571(b) and the fail-safe requirements of § 25.671(c)(1) of Title 14, Code of Federal Aviation Regulations (14 CFR). The proposed exemption, if granted, would allow the McDonnell Douglas Corporation, now a wholly owned subsidiary of The Boeing Company, three years to analyze, redesign and retrofit, as necessary, the flap system on the Model 717-200 airplane, in order to show compliance with the subject regulations.

The petitioner requests relief from the following regulations:

Section 25.571(b), as amended by Amendment 25-72, requires a damage-tolerance evaluation for all critical airplane structure. A safe-life evaluation in accordance with the requirements of § 25.571(c) is allowed if it is established that the application of the damage-tolerance requirements of § 25.571(b) is impractical. The FAA interpretation of § 25.571 typically allows application of safe-life design criteria to landing gear and its attachments only.

Section 25.671(c)(1) as amended by Amendment 25-23, requires that the airplane be shown capable of continued safe flight and landing following any single failure in the flight control system.

The petitioner's supportive information is as follows:

"McDonnell Douglas Corporation (MDC) has not yet shown compliance to FAR 25.571(b) and FAR 25.671(c)(1) for the 717-200 flap system and hereby petitions for a time-limited exemption to these requirements. The 717-200 flap system is identical to the DC-9-34 system (with applicable service bulletins) of which the 717-200 is a derivative. The DC-9-34 was certified under earlier rules and, as a result, has life limited parts identified in the flap system. Compliance to 25.571 (b) requires the structure to be damage tolerant and not safe life as the DC-9-34 is today. The FAA has determined that only landing gear components can be considered to be acceptable as life limited components. Compliance to FAR 25.671(c)(1) requires that the flap system be fail-safe. This rule was not in effect at the time of the DC-9-34 certification.

"In order to show compliance to FAR 25.571 (b), Amendment 25-72 and 25.671(c)(1), Amendment 25-23, considerable analysis will be required with the possible redesign of some parts. It is estimated that this effort, including redesign and retrofit if necessary, will require approximately three years."

McDonnell Douglas Corporation, now a wholly owned subsidiary of The Boeing Company, believes that the granting of this temporary exemption is in the public interest. "It would allow timely delivery of contracted airplanes to the intended operators who would otherwise be obligated to make alternative arrangements to satisfy their commitments to the traveling public." The parts are currently in service on DC-9 aircraft and have demonstrated an exemplary safety record.

"MDC believes that the granting of this time-limited exemption will not adversely affect public safety since the parts in question are currently in service with approximately 835 DC-9 aircraft and have demonstrated an exemplary safety record. The current DC-9 fleet has four aircraft, which have exceeded 100,000 landings, and 443 aircraft, which have exceeded 60,000 landings (717-200 design life). The DC-9 fleet has a cumulative total of over 57,850,000 landings without detrimental flap problems or aircraft control problems. The DC-9 fleet has never had a flap depart the aircraft. The shortest replacement time for DC-9 flap components is 27,500 landings. A very high usage aircraft would be considered to be 3,000 landings a year. A temporary exemption to the rules for three years would mean an aircraft could approach 9,000 landings at the end of the time limit. This would only be approximately one third the life limit of the component with the shortest replacement time."

"MDC understands that it is the intention of the FAA to confer with the JAA [Joint Aviation Authority] on this matter in order to coordinate a common policy. MDC submits that the adoption by the FAA of a coordinated position with the JAA would be in accordance with the Concurrent and Cooperative Certification (CCC) process being employed in the certification of the 717-200.

"MDC is fully committed to developing a solution which will provide for full compliance to FAR 25.571 (b) and FAR 25.671 (c)(1) within the exemption period."

"MDC requests that action on this petition not be delayed by publication and comment procedures for the following reasons: (1) a grant of exemption would not set a precedent in that it is for a time extension from a requirement and not permanent relief from the requirement and therefore does not create a public safety issue, and (2) a delay in acting on this petition would be disruptive to the flying public and create a major economic burden on the manufacturer and operators."

The FAA determined that publication would not delay processing of this petition. A summary of the petitioner's request for Exemption was published in the Federal Register on July 20, 1999 (64 FR 38935). No comments were received.

The Federal Aviation Administration's analysis/summary is as follows:

The FAA has considered the information provided by the petitioner, and has determined that there is sufficient merit to grant a time-limited exemption.

The safe-life approach used for design of certain 717-200 flap components will provide adequate safety while fail-safe and damage-tolerance assessments of the structure are completed. The components in question are single load path flap parts (attach bolts and hinge pins) common to the DC-9-34, which have established life limits in accordance with its certification basis. The 717-200 is a derivative of the DC-9 series airplanes, and the operating weights, speeds, aerodynamics and flap settings are comparable. Therefore, the identified parts, which have successful service experience, have similar fatigue loading.

The Boeing Company (with McDonnell Douglas Corporation, now a wholly owned subsidiary of The Boeing Company) has developed a plan for showing compliance with the subject requirements within a three year time period. The plan has an analysis phase and a redesign/retrofit phase, if needed. During the analysis phase, a more detailed analysis of the existing flap system design will be accomplished to determine whether the existing design can meet the requirements of §§ 25.571(b) and 25.671(c)(1) without redesign. The redesign/retrofit phase will only be necessary if the analysis does not show the existing design to be fail-safe, and that redesign is required in order to meet the fail-safe requirements.

The plan consists of the following milestones:

Milestone	Completion
ANALYSIS PHASE:	
Perform and validate analysis to determine the fail-safe nature of the 717 flap system	First quarter 2000
Decide whether redesign of parts is necessary	First quarter 2000
Complete documentation of fail-safe analysis	Fourth quarter 2000
REDESIGN/RETROFIT PHASE:	
Drawing changes	Fourth quarter 2000
Fabricate parts	Second quarter 2001
Develop service bulletin to modify in-service aircraft	Third quarter 2001
Complete modification of all aircraft	Third quarter 2002

During the three year time-limited exemption period, the FAA and the JAA will work with The Boeing Company (and McDonnell Douglas Corporation, now a wholly owned subsidiary of The Boeing Company) during their analysis and redesign efforts. The Boeing Company has until September 30, 2002, to show compliance with the subject regulations. Failure to do so by September 30, 2002, will result in the airplane no longer being in compliance with the type certification basis, in accordance with § 21.21(b)(1).

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), The Boeing Company is hereby granted a three year time-limited exemption from 14 CFR §§ 25.571(b) and 25.671(c)(1) for the Boeing Model 717-200 series airplanes with the following provisions:

1. Prior to October 1, 2002, Boeing must show compliance to § 25.571 (b) as amended by Amendment 25-72 and § 25.671(c)(1) as amended by Amendment 25-23 for the 717-200 flap system.
2. This exemption terminates on September 30, 2002, unless sooner superseded or rescinded.

Issued in Renton, Washington, on August 20, 1999.

/s/ Vi L. Lipski
Vi L. Lipski
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100